

CLAIMS

1. A solder mask manufacturing method of a printed circuit board adapted to apply a solder mask on a surface of a substrate of the printed circuit board, wherein the surface of the substrate is provided with a conductor pattern having an unsheltered portion and a sheltered portion being covered by said solder mask, the manufacturing method comprising the following steps:

(a) coating a layer of semi-solid solder mask material, which is pre-coated on one side of a metal foil, on the surface of the substrate such that the sheltered and unsheltered portions of said conductor pattern are covered by said solder mask material layer, said solder mask material having a thermal expansion coefficient substantially identical to that of the substrate of said printed circuit board;

(b) pressing said metal foil and curing said semi-solid solder mask material layer into solid form such that said solder mask material layer firmly covers the surface of the substrate;

(c) covering a photo-resist layer on the other side of the metal foil;

(d) photoimaging positions of the photo-resist layer;

(e) removing the photo-resist layer and the metal foil corresponding in location above the unsheltered portion of said conductor pattern for exposing the solder mask material layer above the unsheltered portion of said conductor pattern

to outside;

(f) removing the residual photo-resist layer and then removing the solder mask material layer above the unsheltered portion of said conductor pattern such that said unsheltered portion can be exposed outside; and

(g) removing the residual metal foil.

2. The manufacturing method as defined in claim 1, wherein the substrate of said printed circuit board is made of a resin, and said semi-solid solder mask material in the step (a) is made of a resin which is substantially identical to the resin of the substrate.

3. The manufacturing method as defined in claim 2, wherein the resin contained in the substrate of said printed circuit board is epoxy resin.

4. The manufacturing method as claimed in claim 1, wherein the thickness of the metal foil is between 20 μm ~40 μm .

5. The manufacturing method as claimed in claim 1, wherein the pre-coated semi-solid solder mask material has a thickness of about 30 μm ~100 μm in the step (a).

6. The manufacturing method as claimed in claim 1, wherein the pressure applied on the metal foil in the step (b) is between 10~40 kgf/cm^2 .

7. The manufacturing method as defined in claim 1, wherein the metal foil is removed by chemical solution etching

in the step (e).

8. The manufacturing method as defined in claim 7, wherein the chemical solution used to remove the metal foil in the step (e) is ferric chloride (FeCl_3) solution.

9. The manufacturing method as defined in claim 1, wherein the residual photo-resist layer is removed by using sodium hydroxide (NaOH) solution in the step (f).

10. The manufacturing method as defined in claim 1, wherein the solder mask material layer above the unsheltered portion of said conductor pattern is removed by plasma etching in the step (f).

11. The manufacturing method as defined in claim 1, wherein the residual metal foil is removed by chemical solution etching in the step (g).

12. The manufacturing method as defined in claim 11, wherein the chemical solution used to remove the residual metal foil is phosphoric acid (H_3PO_4) solution.

13. The manufacturing method as defined in claim 11, wherein the chemical solution used to remove the residual metal foil is hydrochloric acid (HCl) solution.